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Trust During the Early Stages of the 2009 H1N1 Pandemic

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Abstract

Distrust of the government often stands in the way of cooperation with public health recommendations in a crisis. The purpose of this paper is to describe the public's trust in government recommendations during the early stages of the H1N1 pandemic and identify factors that might account for these trust levels. We surveyed 1543 respondents about their experiences and attitudes related to H1N1 influenza between June 3, 2009 and July 6, 2009, during the first wave of the pandemic using the Knowledge Networks (KN) online panel. This panel is representative of the US population, and uses a combination of random-digit dial and address-based probability sampling frames covering 99% of the US household population to recruit participants. To ensure participation of low-income individuals and those without Internet access, KN provides hardware and access to the Internet if needed. Measures included standard demographics, a trust scale, trust ratings for individual spokespersons, involvement with H1N1, experience with H1N1, and past discrimination in health care. We found that trust of government was low (2.3 out of 4) and varied across demographic groups. Blacks and Hispanics reported higher trust in government than did Whites. Of the spokespersons included, personal health professionals received the highest trust ratings and religious leaders the lowest. Attitudinal and experience variables predicted trust better than demographic characteristics. Closely following the news about the flu virus, having some self-reported knowledge about H1N1, self-reporting of local cases and previously experiencing discrimination were the significant attitudinal and experience predictors of trust. Using a second longitudinal survey, trust in the early stages of the pandemic did predict vaccine acceptance later but only for white, non-Hispanic individuals.

During a public health emergency, it is critical that risk communication messages convince the public to cooperate quickly with governmental directives such as to boil water, shelter-

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in-place, dispose of tainted food products and take necessary vaccinations or medications. Distrust of the government and its directives often stands in the way of this cooperation. The Pew Research Center for the People and the Press (2010) recently reported that Americans' level of trust in government in general is at an all-time low. Just 22% say they can trust the government in Washington almost always or most of the time, among the lowest measures in half a century. About the same percentage (19%) says they are "basically content" with the federal government, which is largely unchanged from 2006 and 2007, but lower than a decade ago. Trust in the government is usually assumed to be even lower in minority communities, attributed to past discrimination, neglect and such previous events as the Tuskegee syphilis study in the African American community and the perception of poor performance by the government following Hurricane Katrina. The Pew Study (2010), however, found the opposite trend, i.e., African Americans and Hispanics reported higher levels of trust in government than Whites.

It is common to measure the public's level of trust in government policy and in key spokespersons but few studies have tried to explain why the public is so distrustful or what can be done to try to improve the level of trust.

Most of these studies have used hypothetical scenarios rather than real crises (e.g., Seigrist, Earle, and Gutscher, 2003). The purpose of this paper is to describe the public's trust in government recommendations and key spokespersons in the early stages of the H1N1 pandemic, identify factors that might account for these trust levels, and explore whether trust is, in fact, related to later vaccine acceptance.

We focused on the early stages of the pandemic because uncertainty is particularly high during this period and the consequences of compliance are critical. An infectious disease, in particular, can be controlled more successfully if individuals immediately begin following public health recommendations such as hand washing, social distancing or vaccination. The H1N1 pandemic, declared by WHO in June 2009, provided an opportunity to examine the public's trust in the government recommendations and its spokespersons during the early stages of a real emerging health crisis. At that time, there was no vaccine available and uncertainty about whether one would be developed. Public health recommendations included washing hands frequently, avoiding people who were sick, staying away from crowds, and practicing proper hygiene behavior. However, some policies changed or were abandoned as officials learned more about the pandemic's transmission patterns and virulence. Overseas, some public health agencies at first cancelled public events (Stern & Markel, 2009), quarantined people based on nationality or proximity to known cases (Ong, et al., 2009), issued travel warnings ("Swine flu prompts EU warning on travel to U.S.," 2009), and ordered the slaughter of pigs (Ballantyne, 2009). In the US, some schools with one or more cases were closed, but school closures were quickly deemed ineffective in stopping transmission. Later, instead of keeping both the sick and the well at home, only individuals with the virus were asked to stay isolated, until 24 hours after symptoms subsided (Neil, 2009). Flu patients were also told to avoid visiting doctors or hospitals unless symptoms became severe ("CDC Guidance for Responses to Influenza for Institutions of Higher Education during the 2009–2010 Academic Year," 2009). The initial severity of the virus in Mexico created high public demand for a vaccine, leading the Food

and Drug Administration to accelerate its approval process for producing and distributing vaccines and to limit the first available vaccines to healthcare workers and patients at higher risk, such as children and pregnant women (Masterson, 2009). As the pandemic progressed and was perceived as less severe, demand fell and vaccine became available, often for free, to anyone interested (Ruiz, 2009). Although now, more extreme policies, and later shifts in policies may be perceived in retrospect by some as overreaction, they indicate the high degree of uncertainty in the first months of the pandemic.

Trust has been an important construct in communication research at both the interpersonal and public policy levels for decades yet there is still considerable controversy about what it is and how it should be measured. Early researchers looking at communication and persuasion such as Hovland and colleagues (1953) identified two dimensions of trust—expertness and trustworthiness and referred to these concepts collectively as credibility. Generally, risk researchers measure trust by asking about each of its core components. Peters et al. (1997) found empirical support for four components of trust from those identified in earlier research (Renn and Levine, 1991) and Kasperson, et al., 1992): commitment, knowledge and expertise, concern and care. We included these four dimensions in the measure of trust in this study.

A frequent criticism of this research is that respondents are usually asked to use dimensions of trust predetermined by the researcher, rather than dimensions selected by the respondents themselves. Meredith and her colleagues (2007) took a different approach to identifying the components of trust, conducting qualitative research with a sample of African Americans. In a series of focus groups, they asked respondents to react to escalating stages of a bioterrorism scenario. They investigated participants' responses to new information presented in each stage and whether they trusted the information and its source. Using an inductive analysis strategy to assess the role that trust played, their analysis revealed five components of trust: fiduciary responsibility, defined as a relationship in which someone acts in the capacity of another's rights, assets, or well-being; honesty, defined as perceived truthfulness and sincerity; competency, defined as being perceived as well-qualified to perform an act; consistency, defined as uniformity and agreement among messages; and faith, defined as any mention of faith or similar words. Meredith's qualitative research (2007) reinforced the four dimensions found by Peters and colleagues' quantitative work (Peters, Covello, & McCallum, 1997) and convinced us to add a dimension similar to Meredith's fiduciary responsibility, which is defined as the extent to which they believed the government's actions in response to swine flu were in their personal best interest and how much they believed the government would protect them from swine flu. The only dimension identified by Meredith that we did not address was faith.

In addition to assessing trust in the government's recommendations, we also examined trust in individual spokespersons that were active in the early stages of the pandemic. Reactions to individual spokesperson often interact with the public's trust in the overall government recommendations.

Another goal of this study was to identify factors that predict trust in government that might lead to communication strategies to improve trust, and ultimately cooperation, with

government recommendations. Although we did examine demographic characteristics including gender, age, income, education, and race/ethnicity, we agreed with Poortinga and Pidgeon (2003) that affect plays an increasingly important role in lay perceptions of trust and, unlike demographic characteristics, may provide opportunities to intervene to improve trust. Since these affective judgments about institutions vary considerably based on level of involvement and experience with the crisis and the government's reaction to it (Earle and Siegrist, 2003), we added the following factors as potential predictors of trust: involvement with the pandemic measured by self-reported knowledge about it and how closely an individual was following the news about it; and experience with the flu virus measured by whether cases were occurring locally and whether an individual or anyone they knew had experienced flu-like symptoms in the previous two months. Since racial differences have consistently been identified in previous research as related to trust, we also included previous experience with discrimination in health care as a predictor of trust.

Finally, utilizing vaccination data from a second survey with a significant subset of our national sample, we examined the relationship of trust with H1N1 vaccination. Because the focus of this paper is primarily trust and its correlates, we limit our analysis of the second survey data to an examination of vaccination acceptance. In addition, since racial differences in vaccination have been found, we investigate the relationship between trust and H1N1 vaccination by race/ethnicity group.

RESEARCH QUESTIONS

The research questions investigated included:

1. Did the public trust government recommendations in the early stages of the H1N1 outbreak?
2. To what degree did the public trust individual spokespersons that were active in the early stages of the pandemic?
3. Did trust in government recommendations or spokespersons vary across demographic groups?
4. Did demographic characteristics, level of involvement, experience with H1N1, or past discrimination in health care predict trust?
5. Was trust related to later H1N1 vaccine acceptance and did this relationship differ by race?

METHODS

Sample

Participants were a randomly drawn sample of adults from the Knowledge Networks (KN) online research panel who were surveyed about their experiences and attitudes related to H1N1 between June 3, 2009 and July 6, 2009, during the first wave of the pandemic. The KN panel is representative of the US population, and uses a combination of random-digit dial and address-based probability sampling frames covering 99% of the US household population to recruit participants. To ensure participation of low-income individuals and

those without Internet access, KN provides hardware and access to the Internet if needed. While the overall KN panel recruitment response rate is low (7.33%), they utilize panel and survey post-stratification weighting to ensure that the panel as a whole and random samples drawn from it are demographically representative of the US population in order to minimize nonresponse bias. A random sample of 2,498 adults, 18 years of age or older, including oversamples of African Americans and Hispanics, was invited to participate. A total of 1,543 people completed the survey for a completion rate of 62 percent. The survey was administered in both English and Spanish.

In a second national survey of the US population utilizing the KN panel, which was conducted in late January 2010, we attempted to include all original respondents to our first survey. Among the 1543 respondents to the first survey, we were able to re-survey 929 (60.2% of the original sample) who provided information about vaccine acceptance. In this paper, we first analyze trust and its correlates among all original 1543 respondents, and then examine vaccine acceptance for those 929 respondents who participated in the second wave of data collection. A comparison of the demographic characteristics of the 929 repeat respondents with the 604 who did not participate in the second survey indicates that the two groups were similar but not identical. The respondents who participated at wave 2 were older (mean 51 years old vs 46; $p<0.001$) and had slightly more income (53% with income \$50,000 and over vs 45%; $p=0.003$) and education (32% Bachelor's degree or higher vs 25%; $p=0.027$) than those who did not participate a second time. They were also less likely to be black or Hispanic (12% Black vs 14%; 15% Hispanic vs 26%; $p<0.001$) and to have experienced discrimination in health care (17.9% ever experienced discrimination vs 11.1%; $p<0.001$). However, there were no significant differences in how knowledgeable they were about H1N1, how closely they were following news coverage about the disease, whether they reported local cases of the disease or whether they knew anyone who had experienced flu-like symptoms. In addition, there were no differences in their level of trust in the government to handle H1N1. The demographic differences are a limitation in our examination of the relationship of trust to vaccine acceptance to the extent that these variables are related to vaccination. We discuss this further in the discussion section.

KN provides weighting and stratification variables for analysis, incorporating design-based weights to account for the recruitment of the panelists and both panel-based and study-specific post-stratification weights to account for non-response, benchmarked against the Current Population Survey. Weighting variables include gender, age, race/ethnicity, education, US census region, metropolitan area, Internet access, and language spoken at home – English or Spanish. All analyses reported here are weighted to make them demographically representative of the US population, either using weights provided by KN for the first survey or additional weights provided for the 929 re-interviewed respondents in the second survey. More information on the KN research panel is available from its website (<http://www.knowledgenetworks.com>).

Measures—Trust in the government's handling of H1N1 was measured by a scale comprised of seven questions measuring key components of the inductive model of trust proposed by Meredith and colleagues (2007) and the quantitative dimensions from Peters and colleagues' Trust Determination Model. We applied these dimensions in the context of

the swine flu outbreak and developed questions addressing each dimension (Quinn, Kumar, Freimuth, Kidwell, & Musa, 2009). The questions asked for the level of trust the respondents felt regarding the government's openness, honesty, commitment, caring and concern, and competence in addressing H1N1; the extent to which they believed the government's actions in response to swine flu are in their personal best interest; and how much they believed the government would protect them from swine flu. The questions were answered on 4-point scales (varying by question) that ranged from not at all trusting to very trusting. The wording of the questions is shown in Table 2. In this Table, we categorize the responses into "low trust" and "high trust". Low trust includes the lowest two (least trusting) categories which differed by question (e.g., Not at all open, Somewhat open for the first question) and high trust included the highest two (most trusting) categories (e.g., Open or Very open for the first question). These seven items were highly correlated using the original 4-point scale and a factor analysis (principal components extraction with varimax rotation) indicated that all the items loaded on one factor (Cronbach's alpha=0.91). For questions with missing data, we imputed the mean of the remaining items as the response (1.6% or less missing on all items) (Quinn, et al., 2009). This was only done for respondents with two or fewer missing answers. The trust scale score was calculated as the mean of the responses to the seven items. It has a theoretical range of 1 to 4 with higher values indicating greater trust. The trust scale is fairly normal in distribution with a mean=2.29 and a median=2.14, enabling the use of multiple regression in our modeling of trust.

Trust in information sources (spokespersons) regarding swine flu was measured by a series of questions asking respondents to indicate their level of trust in each of a "list of people who have been giving us information about swine flu." Answers were provided on a 4-point scale that ranged from "Do not trust at all" to "Trust totally." Again, for ease of presentation, we categorized the responses into "low trust" (Do not trust at all, Trust a little) and "high trust" (Trust somewhat and Trust totally), and the percent with high trust is shown in the table.

The primary independent variables were standard demographic characteristics and the self-reported experience and attitudinal characteristics of the respondents regarding H1N1. Demographic variables included gender, age, race/ethnicity, income, and education. The level of involvement of the respondent with H1N1 was measured by self-reported knowledge ("How knowledgeable are you about the swine flu?" with answers ranging from "Very knowledgeable" to "Not knowledgeable at all"), and how closely the respondent was following the pandemic. This variable was recoded into three categories, Very Closely/closely, Somewhat closely, and Not too closely/not at all. To measure the respondents' experience with H1N1, they were asked "Has there been a case of swine flu in your city or county?" (Yes or No), and "Have you or anyone you know experienced flu-like symptoms since April?" (Yes or No). Finally, respondents were asked whether they "personally had ever experienced discrimination or been hassled when seeking health care because of your race, ethnicity or color," and responses were categorized as "yes" or "no".

H1N1 vaccination was measured in the second survey by a question which asked whether respondents had "done any of the following in response to the swine flu pandemic." The list

of behaviors included the following: “Gotten the 2009 swine flu vaccine” and was answered “yes” or “no”.

Data Analysis—The data were analyzed with STATA 11 using complex survey analysis procedures to account for the sample design and weights. All analyses except factor analysis and scale reliability utilized the survey weights. Bivariate analyses report adjusted Pearson Chi Square tests for categorical measures and Adjusted Wald F statistics for continuous measures. The relationship between trust and the demographic and attitudinal measures was examined using multiple linear regression models. In all analyses, a p-value of < 0.05 indicated a significant finding.

RESULTS

Table 1 presents the demographic characteristics and level of experience and involvement of the respondents with the H1N1 pandemic. The first research question asked what the public’s level of trust toward the government’s response to H1N1 was at the beginning of the pandemic. Table 2 presents the items that made up the trust scale. The mean score for the trust scale, which ranged from 1 to 4 with higher values indicating greater trust, was 2.30. In general, trust was not high in this early stage of the pandemic. More than half of the sample did not at all agree or only somewhat agreed that the government was committed, caring and concerned, open, competent, honest, had their personal best interest in mind, and would protect them. Table 2 also shows the percent with high and low trust for each item of the scale. Trust ratings were lowest for the belief that the government “will protect you from the swine flu” and that “the government’s actions are in your personal best interest.”

The second research question assessed the trust levels across typical spokespersons who were providing information during the early stages of the pandemic. These included spokespersons at the federal government level such as the President, the Secretaries of Health and Human Services and Homeland Security, and the Director of the Centers for Disease Control & Prevention (CDC), state and local government spokespersons such as public health officials and elected leaders, news reporters and doctors who appear on TV, and religious leaders and “your health care professionals.” The first row of Table 4 shows the overall relative ranking of trust for each of these sources. Trust averages ranged from 3.11 with “your health care professionals” receiving the highest trust ranking to a low of 2.29 for religious leaders.

The third research question asked if trust in government and in individual spokespersons varied across demographic groups. Table 3 shows the mean trust scale scores across gender, age, race/ethnicity, income levels and education. There were no statistically significant differences across gender, age and income (although older respondents showed a non-significant tendency to be more trusting) but significant differences were present for race/ethnicity and education. Whites (2.25) and the heterogeneous group of other race (2.19) reported the lowest trust averages followed by Blacks (2.39) and Hispanics (2.42). Trust scores also varied significantly across education levels. The lowest trust was reported by those with some college (2.18), followed by those who had graduated from high school

(2.28), those with less than a high school education (2.32) and finally those with a college degree (2.38).

We also examined trust in individual spokespersons across demographic groups. Table 4 shows these results. In general, females were more trusting across sources than males. Age presented the same consistent pattern across all sources. When there were statistically significant differences across age, younger people trusted less than older ones. There were statistically significant differences for different racial/ethnic groups in trust across seven of the 11 sources.¹ The pattern was consistent with the overall trust levels in that Whites usually trusted less, followed by Blacks and then Hispanics for all of these seven except for two interesting exceptions. Whites had higher trust ratings of personal health care professionals (3.15) than did Blacks or Hispanics (both 2.97). The other exception was trust of religious leaders. Blacks reported higher trust (2.55) compared to whites (2.25) and Hispanics (2.38). However, even among Blacks, healthcare professionals were the most trusted and religious leaders were the least trusted sources. Although there were no statistically significant differences in overall trust across income levels, there were differences in trust in individual spokespersons by income level for personal health care professionals, CDC, President Obama, the media, the Secretary of Homeland Security and state officials. The pattern of these differences was consistent for personal health care professionals and CDC in that the higher the income, the higher the trust but that pattern was reversed for President Obama and the media (TV, radio or newspaper reporters) in that the lowest income groups trusted the most. Finally, statistically significant educational differences followed a similar pattern: trust was higher for personal health care professionals and CDC the greater the education but lower for President Obama and news reporters. In addition, we found that the lower the education level, the greater the trust of religious leaders.

The fourth research question asked what potential factors would predict trust in government. We found that involvement (greater self-reported knowledge about swine flu and following the news about the disease more closely) were both significantly related to greater levels of trust. Reporting local cases of swine flu was associated with higher levels of trust, while having flu-like symptoms either yourself or someone you knew was not significantly associated with trust. Previously experiencing discrimination in health care was not significantly associated with lower levels of trust in government although there was a strong tendency in this direction (Table 3).

We used regression analysis to examine the independent effects of each predictor while controlling on all other predictors (Table 5). A goal was to determine the degree to which demographic variables alone account for varying levels of trust and then to evaluate the degree to which attitudinal and experience variables improve the prediction. First, we regressed only the demographic variables on trust (Model 1). This model explained four percent of the variance in trust. The significant predictors were age, with those 65 and over having the highest levels of trust compared with the younger age groups, and race/ethnicity,

¹Because of the heterogeneity of "Other race" and the difficulty in interpreting the results for this category, this group is not discussed here.

with Hispanic and Black respondents having higher levels of trust than White respondents. Then, we included the attitudinal and experience variables including involvement, experience, and previous discrimination (Model 2). This model explained twelve percent of the variance in trust. In this model, age was no longer significant, and significantly higher trust levels were found only for Black respondents in comparison with White respondents, indicating that the age and Hispanic differences found in Model 1 were accounted for by the attitudinal and experience variables. Closely following the news about the flu virus, having some self-reported knowledge about H1N1, reporting local cases and previously experiencing discrimination were the significant attitudinal and experience predictors of trust.

Finally, the last research question asked whether trust in government was related to subsequent vaccination behavior. To address this, we examined the mean levels on the trust in government scale of those who reported having gotten or not gotten the swine flu vaccine in the second survey, both overall and by race/ethnicity. Because of the small number of “other” race individuals, we excluded this group from the race comparison. Table 6 shows that there was a significant difference in trust between those who did not report getting the vaccine (mean 2.25) and those who reported getting it (mean 2.37). There were also significant race/ethnicity differences in these findings with the only significant relationship between trust and vaccine acceptance found among the white respondents and, surprisingly, no significant relationship among black and Hispanic respondents. Table 6 also shows the effect size for these relationships. A value of 0.2 for Cohen’s *d* (the effect size measure used) is considered small. Thus, it is evident that the effect sizes of the relationship between trust and subsequent vaccine acceptance is quite small, both overall and for white, non-Hispanic respondents.

DISCUSSION

If there is any hope of controlling the spread of a highly infectious disease, it is critical that risk communications convince the public to follow government recommendations in the early stages of a crisis. Yet, it is during this period that uncertainty will be the greatest. How widespread is the threat? How severe will the disease be? What containment measures will be most effective? The public will have to trust experts and officials before it cooperates with their recommendations. Previous research (Peters, Covello, & McCallum, 1997) has discovered that individuals and institutions are trusted when the public perceives that they are knowledgeable and expert, they are open and honest, and concerned and caring. The Pew trust in government surveys show us the challenge involved in achieving these perceptions. Trust for government in general is at an all time low (just 22% say they can trust the government in Washington almost always or most of the time) so it is unlikely that the public will automatically trust specific government recommendations during a crisis. Larson and colleagues (2011) outlined three reasons why trust in government recommendations may have eroded in recent years. First, trust is affected when public officials disagree over a policy recommendation. Second, communication has changed from top-down expert to consumer systems to non-hierarchical dialogue based systems. With these changes has come public questioning and emergence of dissent groups. Finally, the media’s attempts to

balance coverage by providing equal opportunity to all viewpoints has given outlier views equal attention.

Unlike most trust studies which use hypothetical scenarios, we surveyed a representative group of the public as it experienced the beginning of a real pandemic. While this pandemic turned out to have much less severe disease than expected, in June 2009 when the survey was conducted there was considerable uncertainty about the path the pandemic would take and what government actions would be recommended. We found that trust in the government's response was low among the public in general. Perhaps this low initial trust played a role in the subsequent low rate of vaccination and the concerns over the safety of a new vaccine. Trust varied among different demographic groups. Unfortunately, some of the groups with lower trust were those who would later be identified as priority groups for vaccinations, e.g., the younger adults. Similar to recent Pew data (The Pew Study, 2010) we found that both African Americans and Hispanics reported higher trust levels than did Whites. These results might reflect general levels of trust in the government, particularly early in the administration of President Obama, or it may be that these groups felt particularly vulnerable to this illness because they had less ability to practice self-protective behaviors as they tended to live in more crowded conditions, use more public transportation, and have less ability to socially isolate themselves and their families (Quinn, Kumar, Freimuth, Musa, Casteneda-Angarita, & Kidwell, 2011). Without the ability to protect themselves, they may have felt the need to place their trust in the government to protect them. Hispanics reported the highest amount of trust. Since this pandemic was first reported in Mexico, they may have had increased awareness of the threat and felt particularly susceptible to the illness.

Trust in individual spokespersons varied considerably (3.11 to 2.29 on a 4 point scale). The most trusted source was one's own physician but, even in this case, there were demographic differences. African Americans and Hispanics trusted their own physicians less than did Whites. The same pattern emerged for the CDC, which is the organization most likely to lead a public health response to an infectious disease crisis. Perhaps some historic precedents such as the Tuskegee Study and the anthrax crisis have eroded trust from minority groups for this organization that has enjoyed a higher level of trust from the public than most agencies of the federal government. One particularly disturbing finding was the low level of trust for local elected officials such as mayors and county commissioners. These individuals almost always emerge as local spokespersons in any kind of crisis yet these results suggest they may not be very effective in establishing trust and cooperation. Since local public health officials were near the top of the trust rankings, it would be sensible to use them as local spokespersons, or, at the very least, have them appearing with local elected officials. Although religious leaders are trusted little in this kind of crisis in general, they are much more trusted by African Americans.

The measure of trust we used, which was based on both qualitative research with African Americans and quantitative research with general audiences, worked well. Commitment was the dimension of trust rated the highest, which is consistent with the earlier work of Peters and colleagues (1997) on dimensions of trust surrounding an environmental issue. Even though we did include an item that addressed competence, this item was highly correlated

with the other trust questions and thus the results did not support two independent dimensions of trust suggested by many researchers such as Seigrist, et al. (2003). Since the competence factor is based on past performance, it is possible that the pandemic was so novel and at such an early stage, the public had little feel for the government's ability to perform well in managing it. Moreover, at this point in the pandemic, the government had taken little action. It was still unclear whether a vaccine would be produced and who would be recommended to take it. School closures were occurring and were quite controversial but based on local decisions so may not have influenced the competence item very significantly. Future research should look at these issues longitudinally as an independent competence factor could emerge as the public has more opportunities to judge the government's ability to manage the crisis.

Our results suggest that communication may play an important role in developing a theoretical understanding of how trust develops. Involvement with the issue was positively related to trust. Those who reported higher levels of knowledge and were following the news more closely also reported higher trust. These findings suggest that increased communication about a crisis should have a positive impact on trust. The key in this communication is getting the attention of those who are not interested or who are avoiding the topic. Direct experience with the pandemic, as indicated by reported cases in the community, was related to higher levels of trust. Perhaps those with more direct experience were satisfied with the government's performance. It was so early in the pandemic when the survey occurred and so few had had this kind of experience that it is difficult to interpret this finding. Not surprisingly, those who reported that they had experienced discrimination in health care in the past had lower levels of trust in the government, reinforcing the notion that trust is slow to earn but quickly lost. Only 12 percent of the sample did report this discrimination but this group will need careful attention in the future to regain their trust.

There were statistically significant higher trust levels for white, non-Hispanic respondents who chose to get vaccinated than those who did not, but the differences were small and only explained small proportions of the variance in vaccine acceptance. For Blacks and Hispanics, trust in the government's handling of H1N1 did not predict vaccine acceptance, results that certainly contradict conventional wisdom about the role of trust and health behaviors. Perhaps trust in government is less important in vaccine acceptance compared to its role in other health behaviors. In a recent Swiss study, trust in medical organizations, and not trust in government, was found to be predictive of actual vaccination status during the H1N1 pandemic (Gilles et al. 2011). One should also keep in mind that trust was measured in terms of the government's handling of the pandemic, not specifically trust in vaccines. It is likely that measures of trust in the vaccine itself would be much stronger predictors of vaccine acceptance. Further study is needed to explore the relative importance of *who* and *what* is the object of the public's trust in explaining vaccine acceptance. These results certainly suggest that a number of other factors were involved in explaining vaccine acceptance and future research should continue to try to identify what those factors are. This is particularly crucial given the significant attention given to vaccine critics in the media.

What are the practical implications of this research? First, there is a consistent pattern of results across this pandemic and other public health crises that the public does not

necessarily trust the government's recommendations and that lack of trust will impact the extent of its cooperation. There are some suggestions in these results on ways to enhance trust. The choice of spokespersons is critical. Although many have argued for a single spokesperson, this may be a naïve recommendation in a true national emergency. Given the pervasiveness of the mass media, there is a need for multiple spokespersons, but there can be efforts to produce consistent messages and for official sources to be forthcoming about giving timely and complete information to the public, even if that information is not reassuring. These results clearly argue for the expert source rather than the political leader. They also argue for targeting of spokespersons to audiences when it is possible. For example, while religious leaders may not be effective for most audiences, they might enhance trust when used with African American audiences. Likewise, a physician or public health official might be less trusted by African Americans than by other groups. Young adults represent a real challenge for public health officials. They trust spokespersons less in general and are accustomed to different kinds of relationships with their sources than older audiences. Social media users, who tend to be younger, expect opportunities to dialogue with their spokespersons and don't react well to the role of passive audience member. Government agencies have begun to be active users of social media. The challenge will be to adapt the emergency messages to these new forms of media when time pressures are so intense and the information so critical.

The regression results demonstrate that much more work needs to be done to understand what contributes to trust in government during a public health emergency. Previous efforts to establish trust in a crisis have tended to focus on demographic groups often based on the assumption that trust was lower in minority groups. Results from this study corroborate other national polls such as Pew's that measured general trust in government and challenge this assumption. Minority groups may trust government more than Whites; however, that could be a temporal phenomenon related to the current Obama administration. Including all the standard demographic characteristics, we were only able to explain four percent of the variance in trust. Clearly, researchers need to be looking beyond demographics to understand trust differences. Even when we included the most obvious predictors of trust such as involvement, and relevant past experience including discrimination, we only explained twelve percent of the variance in trust, triple what demographics alone could do. One direction this research should take in the future is to include political ideology in these analyses. Underlying values about the role of government may influence trust in government recommendations during a crisis. We also need more longitudinal research to see how trust fluctuates during an on-going crisis. At the time of this study, government action was minimal. It was not yet clear if a vaccine would be developed or who would be recommended to take it. As the pandemic unfolded, many more issues arose that could impact trust such as perceived success or failure of the government's early mitigation efforts such as school closures, safety of the vaccine, fairness of the priority groups and distribution systems. Researchers and practitioners need to understand trust better so they can work to strengthen it between crises to ensure it is in place when it could be a matter of life and death

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Table 1

Demographic Characteristics of the Sample and Respondent Involvement and Experiences Regarding Swine Flu^a (N=1543)

Characteristic ^b	Unweighted N	Weighted %
Gender		
Male	768	48.2
Female	775	51.8
Age, years		
18–34	353	28.2
35–64	907	57.0
65	283	14.8
Mean (SE)	1543	46.3 (0.54)
Race/Ethnicity		
White, Non-Hispanic	991	68.8
Black, Non-Hispanic	194	11.4
Other, Non-Hispanic	64	6.1
Hispanic	294	13.7
Income		
<25,000	364	25.3
\$25,000 – \$49,999	408	26.1
\$50,000 – \$74,999	299	20.0
75,000	472	28.6
Education		
<High School	193	13.6
High School	423	31.7
Some College	480	27.8
Bachelor's degree or higher	447	26.9
How knowledgeable about H1N1 are you?		
Very knowledgeable/Knowledgeable	519	29.8
Somewhat knowledgeable	765	49.7
Not knowledgeable at all	256	20.5
How closely following H1N1?		
Very closely/Closely	369	21.0
Somewhat closely	577	36.4
Not too closely//Not at all	578	42.6
Have there been local cases of H1N1?		
No/Don't know	799	54.1
Yes	735	45.9
Have you/anyone you know experienced flu-like symptoms since April?		
No	1293	83.7
Yes	239	16.3
Ever experienced discrimination in health care		

Characteristic ^b	Unweighted N	Weighted %
No	1329	87.6
Yes	202	12.4

^aTotals vary due to missing data

^bSee text for definitions.

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Table 2

Trust in the Government Regarding Swine Flu (Ordered from highest trust to lowest trust)

Items in the Trust in Government Scale	Unweighted N	Weighted %	
		Low trust ^a	High Trust ^a
How committed do you think the government is to protecting you from swine flu?	1527	54.2	45.8
How much caring and concern do you think the government has shown about people who might be affected by this swine flu outbreak?	1525	59.8	40.2
How open do you think the government is with information regarding swine flu?	1522	60.6	39.4
How competent do you believe the government is in handling swine flu?	1519	65.0	35.0
How honest do you think the government is with information regarding swine flu?	1519	65.1	34.9
How much do you believe that the government's actions in response to swine flu are in your personal best interests?	1521	68.4	31.7
How much do you believe the government will protect you from the swine flu?	1527	78.7	21.3

^aSee text for definitions of Low trust and High trust.

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Table 3

Trust in the Government Regarding Swine Flu, By Respondent Demographic Characteristics and Involvement and Experiences Regarding Swine Flu

Characteristic	Mean trust scale value (SE) [†]
Overall	2.29 (0.020)
Gender	
Male	2.27 (0.03)
Female	2.30 (0.03)
Age	
18–34	2.25 (0.04)
35–64	2.28 (0.03)
65	2.38 (0.05)
Race/Ethnicity ^{**}	
White, Non-Hispanic	2.25 _a (0.02)
Black, Non-Hispanic	2.39 _{ab} (0.05)
Other, Non-Hispanic	2.19 _{ab} (0.11)
Hispanic	2.42 _b (0.04)
Income	
< \$25,000	2.24 (0.04)
\$25,000 – \$49,999	2.33 (0.04)
\$50,000 – \$74,999	2.23 (0.05)
\$75,000	2.32 (0.03)
Education ^{***}	
<High School	2.32 _a (0.06)
High School	2.28 _{ab} (0.04)
Some College	2.18 _b (0.03)
Bachelor's Degree	2.38 _a (0.03)
How knowledgeable about H1N1 are you? ^{***}	
Very knowledgeable/Knowledgeable	2.36 _a (0.04)
Somewhat knowledgeable	2.32 _a (0.03)
Not knowledgeable at all	2.08 _b (0.04)
How closely following H1N1? ^{***}	
Very closely/Closely	2.51 _a (0.05)
Somewhat closely	2.34 _b (0.03)
Not too closely//Not at all	2.13 _c (0.03)
Have there been local cases of H1N1? ^{***}	
No/Don't know	2.22 (0.03)
Yes	2.36 (0.03)
Have you/anyone you know experienced flu-like symptoms since April?	
No	2.30 (0.02)

Characteristic	Mean trust scale value (SE) [†]
Yes	2.23 (0.05)
Ever experienced discrimination in health care?	
No	2.30 (0.02)
Yes	2.18 (0.07)

[†] Overall F-statistic:

* p 0.05;

** p 0.01

*** p 0.001.

Note. Means with differing subscripts among categories are significantly different at the p .01 level (to correct for inflation of Type I error) based on the Adjusted Wald F statistic from post hoc paired comparisons.

Trust in Information Sources about Swine Flu, By Respondent Demographic Characteristics (Ordered from highest overall trust to lowest overall trust)

Table 4

Demographic Characteristic	How much do you trust information about swine flu delivered by each of the following? [†] (% Trust somewhat or Trust totally)										
	Your health care professionals	CDC official such as Acting Director, Dr. Besser	State or local public health officials	Secretary of HHS (Kathleen Sebelius)	President Obama	TV, radio or newspaper reporters	A TV doctor such as Dr. Sanjay Gupta on CNN	Secy of Home-land Security (Janet Napolitano)	State government officials such as governor	Local elected officials such as mayor, county commissioner	Religious leaders
Overall	83.1	78.5	71.0	68.6	59.8	56.5	55.9	55.9	55.5	51.8	42.4
Unweighted N	1505	1508	1506	1505	1504	1508	1496	1506	1511	1511	1507
Gender											
Male	80.5*	75.0*	67.9*	64.8*	53.8*	53.0*	50.3*	51.0*	53.9	48.8	41.3
Female	85.6	81.7	73.9	72.1	65.5	59.8	61.0	60.4	57.0	54.5	43.4
Age											
18-34	78.8	76.2	69.8	68.7	57.7	55.4	47.7 _a *	51.8 _a *	53.1	50.0	41.6
35-64	84.0	79.0	70.4	67.3	60.8	55.5	58.7 _b	55.4 _{ab}	54.8	51.0	42.5
65	87.7	80.4	75.4	73.3	60.0	62.3	60.3 _b	64.9 _b	62.7	57.9	43.2
Race/Ethnicity											
White, Non-Hispanic	85.2	80.4	71.5	66.9 _a *	53.9 _a *	52.3 _a *	54.7 _a *	52.0 _a *	56.1	52.0	39.6 _a *
Black, Non-Hispanic	79.0	78.6	70.9	74.4 _{ab}	82.6 _b	69.7 _b	68.0 _b	66.1 _b	57.0	54.6	57.5 _b
Other, Non-Hispanic	84.1	70.9	62.4	56.6 _{ab}	51.5 _{ac}	58.4 _{ab}	44.2 _{ab}	53.4 _{ab}	48.2	44.0	27.1 _a
Hispanic	75.5	72.0	72.6	77.6 _b	73.9 _{bc}	65.2 _b	56.7 _{ab}	67.9 _b	54.4	51.6	50.3 _b
Income											
< \$25,000	77.8	72.4 _a *	67.6	67.9 _{ab} *	65.6	61.6 _a *	58.5	57.3 _a *	49.4	50.9	46.4
\$25,000 - \$49,999	80.6	78.6 _{ab}	70.0	72.7 _a	59.8	60.4 _{ab}	56.9	60.8 _a	59.5	57.4	40.1
\$50,000 - \$74,999	86.7	77.9 _{ab}	69.1	59.8 _b	53.5	48.6 _b	52.0	44.3 _b	52.8	46.5	41.2
> \$75,000	87.6	84.2 _b	76.2	71.6 _{ab}	59.2	54.0 _{ab}	55.3	58.3 _a	59.2	51.1	41.6
Education											
<High School	79.7 _a *	72.6 _a *	67.6	71.0	63.2	61.3	58.3	56.6	51.7	47.6	48.0

How much do you trust information about swine flu delivered by each of the following?[†] (% Trust somewhat or Trust totally)

Demographic Characteristic	Your health care professionals	CDC official such as Acting Director, Dr. Besser	State or local public health officials	Secretary of HHS (Kathleen Sebelius)	President Obama	TV, radio or newspaper reporters	A TV doctor such as Dr. Sanjay Gupta on CNN	Secy of Homeland Security (Janet Napolitano)	State government officials such as governor	Local elected officials such as mayor, county commissioner	Religious leaders
High School	78.0 _a	76.1 _a	69.4	68.8	61.5	59.0	56.4	54.8	53.4	54.6	45.8
Some College	84.9 _{ab}	78.7 _a	69.3	65.3	55.6	53.2	52.1	54.5	56.4	50.7	40.6
Bachelor's Degree	89.1 _b	83.9 _a	76.3	70.5	60.5	54.6	57.8	58.1	59.0	51.6	37.3

[†] Overall Chi-square test:

* p < 0.05.

Note. Means with differing subscripts among categories are significantly different at the p < .01 level (to correct for inflation of Type I error) based on the Adjusted Wald F statistic from post hoc paired comparisons.

Table 5

Multiple Regression Coefficients for Predictors of Trust in Government Regarding Swine Flu (Standard Errors in parentheses)

Demographic Characteristics and Perceptions and Experiences Regarding H1N1	Model 1 Demographics Only	Model 2 Demographics & Perceptions/Experiences
Female	0.047 (0.038)	0.039 (0.037)
Age (Ref: 18–34)		
35–64	0.029 (0.046)	-0.026 (0.047)
65	0.161 (0.070) *	0.053 (0.072)
Race/Ethnicity (Ref: White, Non-Hispanic)		
Black, Non-Hispanic	0.178 (0.063) **	0.135 (0.064) *
Other, Non-Hispanic	-0.074 (0.109)	-0.123 (0.105)
Hispanic	0.208 (0.058) ***	0.112 (0.067)
Income (Ref: < \$25,000)		
\$25,000 – \$49,999	0.080 (0.059)	0.057 (0.057)
\$50,000 – \$74,999	0.025 (0.069)	-0.002 (0.067)
> \$75,000	0.105 (0.058)	0.072 (0.055)
Education (Ref: <High School)		
High School	-0.001 (0.073)	-0.020 (0.068)
Some College	-0.090 (0.072)	-0.101 (0.067)
Bachelor's Degree	0.105 (0.074)	0.073 (0.070)
Somewhat knowledgeable about H1N1	-	0.183 (0.052) ***
Very knowledgeable/knowledgeable about H1N1	-	0.117 (0.062)
Following H1N1 news somewhat closely	-	0.185 (0.047) ***
Following H1N1 news very closely/closely	-	0.353 (0.058) ***
Local cases of H1N1	-	-0.100 (0.039) **
Experienced flu-like symptoms since April	-	-0.085 (0.057)
Ever experienced discrimination	-	-0.219 (0.075) **
Constant	2.118 (0.084) ***	2.053 (0.088) ***
N	1532	1502
R ²	0.041	0.118
Adjusted R ²	0.033	0.107

* p 0.05;

** p 0.01

*** p 0.001.

Relationship of trust and subsequent acceptance of the H1N1 vaccine, Overall and by Race/Ethnicity

Table 6

	Un-weighted N	Mean (SD) Trust Scale Score				Effect Size ^b
		Did not get the vaccine (N=709)	Did get the vaccine (N=216)	Significance ^a		
Overall	929	2.25 (0.61)	2.37 (0.60)	.018	0.197	
Race/Ethnicity						
White, Non-Hispanic	644	2.23 (0.61)	2.36 (0.54)	.034	0.218	
Black, Non-Hispanic	109	2.48 (0.58)	2.38 (0.62)	ns	0.170	
Hispanic	130	2.30 (0.61)	2.36 (0.70)	ns	0.094	

^a One-way ANOVA;

^b Cohen's d